





## CONSTRUCTORS' COMPETITION 1995

On Tuesday 6<sup>th</sup> June we meet at the Marconi College, Arbour Lane, to see the latest products of members being entered in this years competition.

Paying particular attention will be Geoff, G3EDM and John, G8DET who have volunteered their services as judges and depending on the number of entries will award the prizes of £10, £7 and £5 to the chosen 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> winners; as in previous years there is also a prize of £5 for any first time winner.

We like the meeting to be informal, however, competitors should observe two simple rules:-

1. For the benefit of the judges and the subsequent Newsletter report, please provide a short written description of the entry, together with your name and callsign.
2. To add to the interest, please be prepared to give a short talk on your entry.

The meeting will begin at 7.30pm and we can look forward to an enjoyable evening.

## NATIONAL FIELD DAY 1995

At 8.30am on Saturday 3<sup>rd</sup> June, volunteers will gather at Howletts Hall Farm to assemble the station G0MWT/P which at 3.00pm will go "on the air" to represent the Chelmsford Amateur Radio Society in this years NFD.

Again this year, we are only entering the Restricted Section of the contest which means a simpler aerial system, however, the new rule allowing a second Rx on site sounds like fun for those members who join in!

Please note that the site is the same as last year, the actual spot on the map is TL623015 and although access looks attractive from the Fryerning end of the track, this route is not recommended because the residents frown on strangers in their 'executive' rural territory. Limited space in this Newsletter does not provide for a detailed map of the area, so if you are unsure of the actual location please ask for directions. Please support this event, particularly at the beginning when lots of hands are necessary to erect the aerials.

### DATES FOR YOUR DIARY

3/4 June NATIONAL HF FIELD DAY - Howletts Hall Farm.  
6 June CLUB MEETING - Constructors' Competition.  
11 June ELVASTON CASTLE NATIONAL RADIO RALLY.  
4 July CLUB MEETING - 'THE MUSEUM' - Dr. Geoff Bowles.  
9 July CHAIRMAN'S GARDEN PARTY - QTH of John, G8DET.  
16 July OPEN DAY, Chelmsford Science/Industrial Museum.

## LAST MONTHS CLUB MEETING, Andrew, G4KQE

The May meeting was split into several sections, with Andrew explaining D.F. from a hunter's point of view, Dick explaining from the hidden transmitter's angle, a video of an actual D.F. event in progress and a live demonstration to give members "hands on" experience in taking a bearing with a D.F. receiver.

After the introduction from Dick, Andrew started, with the aid of the overhead projector, to describe the basic object of D.F., that is to locate a hidden transmitter with the aid of a suitable directional receiver. Other aims may be to come first, to win Trophies, to "get your own back" by being the hidden station, but above all, to have fun. Andrew showed how typical bearings are plotted on a map, which should cross at the transmitter, but other overhead slides showed how error could creep in, and in practice, the bearings give a search area. Bearings can be a few degrees out if the signal is bent in any way, such as by power lines, buildings or electric cables in the ground.

A DF hunters basic equipment consists of a DF Set, a compass, a protractor and a map. Other items such as food, water and spare clothes are added to the kit of parts as DFs are undertaken further afield on National events.

Andrew described a DF Set in detail, which must be small, lightweight and robust to withstand being dragged through the undergrowth. It must be reasonably sensitive to hear weak signals at the start of the event but have an attenuator so that the gain can be turned down as you get closer to the transmitter, to prevent over-load. A unique feature of a DF Set is the "sense" system. This does not refer to the state of mind of the competitor but to the system of combining the signal from a vertical, untuned whip, into the main aerial to ascertain in which direction along the axis of the aerial coil the signal is coming from. A reverse sense does not necessarily mean the DF hunter has lost his marbles, more likely that his bearing is 180 degrees out!

D.F. Sets are fairly straightforward to build; tried and tested designs utilise TAD100 or TCA440 receiver IC's. The circuit diagram and PCB layout are published in the Amateur Radio Direction Finding Manual; Dick and Andrew have copies and can advise on the source of components.

Dick, with the aid of overheads, then described what constitutes a "good" hidden transmitter. If rivers are available, these can be put to good use as bearings may go right down the middle and the hunter will have to decide on which bank to look first. Rarely at the start is it obvious where the hidden transmitter is, but on a recent National event in Devon, the first bearing went right across Tor Bay to a small peninsular called "Hope's Nose", which could be seen from the start; the transmitter could not be anywhere else! ➡

## LAST MONTHS CLUB MEETING - continued

Aerial systems can mislead hunters. If a quarter wave is erected, it will draw in the DF Sets like bees to a honey pot, but earthing the far end of the wire will produce another current hot spot, and draw the receivers to that end. Aerials that are teed-in produce interesting radiation patterns and add confusion to those who like following aerials; there is no reason why a piece of wire strung over bushes need be attached to the transmitter at all. Indeed, if you have a dummy aerial, then why not also have a dummy operator? Dick then introduced "Fred", the top half of a tailor's dummy wearing a camouflage jacket who is sometimes positioned in a bush near an earth stake so the competitors think they have found the transmitter, when all they have found is "Fred". When we ran the National Final one year, Fred also had a voice - a DF set inside him, that really gave the competitors something to think about!

An important part of the hidden station is the ATU, which must be able to tune any random wire. Dick demonstrated his ATU; he also had on display his crystal controlled transmitter for members to look at during the tea break.

While Dick prepared the video player, Andrew described the two types of DF event. The local ones take place on a Friday evening at 7.30pm either at Tiptree Heath or Fordham Heath, with fixed time transmissions, finishing up in a pub for a social get together. National events take place on Sunday afternoons and can be almost anywhere in the UK, organised by other Radio Clubs. There are transmissions at 1.20pm and 2.00pm followed by random signals until 4pm at not more than 15 minutes intervals.

The video film was of a Dartford Heath event a few years ago, with several well known club members shown taking bearings and thrashing about in woods trying to find the transmitter. This film showed members the theory that Dick and Andrew had explained being put into practice.

During the extended tea break Dick and Andrew invited members to join them in the car park for a "hands on" live demo. We had arranged for Richard Witney, G4ICP/P to park up near Crix Corner at Hatfield Peverel and to throw a piece of wire up into some trees, to provide a good signal on 1950KHz in the centre of Chelmsford. Using the equipment provided, members in turn were able to take a first bearing for the direction of the "hidden" transmitter. We had some photocopy maps, with an imaginary second bearing plotted which went through the place where G4ICP/P was located; thus, members bearings taken in the car park should form a cross at the place where Richard was parked.

Peter Graves, another keen hunter, was on hand in the club room to assist members in plotting their bearings on the maps.

Quite a few members took bearings, the majority were fairly close to the 61° to Hatfield Peverel, which was very good considering the surrounding metalled road and steel framed buildings.

After tea, Dick and Andrew answered a few questions and related some amusing episodes from their DF activities, like the time Andrew had been near the transmitter for several minutes, and had stopped to clean his glasses. Whilst doing so, Dick walks straight along a stream and into the TX site, only a few feet from where Andrew was standing!

All too soon the evening came to a close. If anyone would like to try Direction Finding, there is always a seat available on a Friday night with a spare DF Set available for use. If you would like to have a go at hiding, again a complete kit (even down to the pencils and paper) is available for anyone with a class A licence. Dick or Andrew would be very pleased to hear from anyone wishing to join this interesting, fun sport.

## IMD UPDATE - Pat, G0SBQ

The final total of qso's made by GB0MWT was 457.

By band: 160m=2, 80m=284, 40m=141, & 20m=30.

By mode: CW=118, SSB=339.) 287 of these contacts being with UK stations. For those members who have not yet seen the Science & Industry Museum in Sandford Mill Road there will be an opportunity at their Open Day on Sunday 16<sup>th</sup> July between 1000 and 1600hrs. The Club will be supporting this event by operating a demonstration station, GX0MWT. Members requiring further information should contact Brian G3CVI, Geoff G7KLV or Pat G0SBQ, at the next Club meeting.

## COMMITTEE MEETING

The next Committee meeting will be held at 7.30pm on Wednesday 14<sup>th</sup> June, in Telford Lodge, you are welcome to join us.

## SIX METRE NEWS - Ela, G6HKM

The band has come to life again, my best dx so far this year has been CT3FT, EU6MS and 4Z4TT, the gotaway was SV9ANJ. During the first 2 weeks of June we will all be looking for the D44BC dxpedition.

## PROTECTIVE MULTIPLE EARTHING - Geoff, G7KLV

In this day and age it will soon be possible to hold a conversation using only three letter abbreviations without recourse to any of the dreaded four letter words; SSB, PMR, UHF, XYL, QSO - the list is endless. Here's another one to add to the list - PME.

At one time the neutral point in an electrical distribution system was only earthed at one point, that is at the generator or distribution transformer.

For safety reasons all metalwork associated with the consumer's electrical installation is connected to earth. The provision of a suitable earth was up to the consumer. Many of the earths left a great deal to be desired and would probably not be of sufficiently low resistance to blow fuses under earth fault conditions.

For a number of years now the suppliers have been using a system known as Protective Multiple Earthing or PME. This was a continental idea - one of the few good ones. It is now generally available for new consumers and existing ones provided their installations meet certain requirements. Under this system the supplier offers the consumer an earth terminal which is connected to the supply neutral. The neutral is connected to earth at a multiplicity of points along the distribution lines.

There is a dangerous situation which can arise. What happens if there is a break in the neutral of the supply cable? Under the worst possible conditions the consumers earthed metalwork could then be at 240 volts relative to mother earth. The consumer is safe as he is in an equipotential zone, rather like the sparrow sitting on the 33kV lines. The consumer is quite safe so long as he can't touch his own earthed metalwork and something that is at true mother earth potential simultaneously. A neighbour of mine had a broken neutral line, so it is a situation which can arise.

The supplier lays down stringent conditions before a consumer is granted the PME earth facility. The most important are the bonding of the water and gas supplies to the consumers earth terminal. A bonding cable of 10mm csa is normally required because under broken neutral conditions these services may have to carry a considerable current.

So far, so good. What happens when a garage is fed from the house supply? In this case the garage would be fed via an RCD and the garage would have its own exclusive earth stake.

Another potentially dangerous situation arises where a metal water tap is installed outside the house for a hose. Under broken neutral conditions this could be at 240 volts relative to mother earth! For use with PME an insulated plastic insert is required to isolate the outdoor pipe and tap.

Provided the regulations have been observed the PME system does ensure that the consumer has a good reliable earth. This is more than can be said for some of the earthing systems I have seen! It is essential that the connection of the consumers earthing terminal to the supply neutral is only carried out by the supply authority and not by the consumer himself. Eastern Electricity publish comprehensive guidance on PME earthed systems but it is hoped that these notes have removed some of the mystery from the expression Protective Multiple Earthing.

There should be a label at the meter if the supply is PME.

It will be noted that I have carefully avoided any mention of the supply to the shack. If the shack is a room within the house with a PME supply a rather tricky situation arises, particularly if any sort of radio frequency earth is required. Watch this space for a further instalment,

73 from Roy & Ela Martyr,  
G3PMX & G6HKM

☎ (01245)360545

1, High Houses,  
Mashbury Road,  
Great Waltham,  
CHELMSFORD,  
Essex, CM3 1EL.

## WANTED TO BUY

2 Metre Mobile, 25 to 50 Watts. Contact Eddie Henrard, G7TYM,  
☎ (01245)268756 or email: Compuserve ID# 100302,2514

## WANTED

A small 50pf + 50pf dual-ganged tuning capacitor (or larger value for modification). Seems a rare commodity these days! Fair price paid for the right component. Andrew G4KQE, ☎ (01376)583094

## WANTED

(For friend starting out on computers). Old IBM compatible PC system that has been replaced by more up to date equipment, such as XT, 286, etc. Complete system wanted :- PC, Screen, Keyboard and printer. Has anyone got such spare equipment gathering dust in their loft/shack? Reasonable price paid for the right system.

Andrew G4KQE, ☎ (01376)583094